

Exhibit 33

**THE AFTERMATH OF FINANCIAL CRISES:
EACH TIME REALLY IS DIFFERENT**

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Sir John Hicks Lecture in Economic History
Oxford University
April 28, 2015

I. INTRODUCTION

In my lecture this afternoon, I want to discuss the aftermath of financial crises. The 2008 episode has—not surprisingly—renewed interest in this topic. For decades, banking panics and financial turmoil were thought to be something that used to happen in the bad old days. They were talked about in economic history classes, but not in the rest of the economics curriculum.

However, the meltdown in U.S. and European financial markets following the collapse of Lehman Brothers has brought crises back to the center of modern macroeconomics. The 2008 episode not only convinced economists that financial crises can still happen in modern advanced economies, but also generated tremendous interest in understanding what their effects actually are. As a result, there has been a flurry of important research on this topic.

Much of this research has focused on what the past can tell us about the effects of financial crises. Carmen Reinhart and Kenneth Rogoff wrote their best-selling book, *This Time Is Different*, examining the impact of crises over the past eight centuries.¹ And numerous other scholars, including Michael Bordo and my colleague at Berkeley Barry Eichengreen, have also made fundamental contributions concerning the lessons from history.² Most of this literature has focused on what has happened ***on average*** following financial crises. And, on average, the results have been pretty grim. Following

a financial crisis, output typically falls, unemployment rises, and government debt skyrockets.

But, the thesis of my talk this afternoon is that this focus on what has happened on average after financial crises misses a very important part of the story—which is the variation **across** episodes. What I think history actually teaches us is that the aftermath of financial crises is highly variable. Some aftermaths are bad, but some really aren't. The banking panics of the 1930s ushered in the Great Depression in the United States. But the meltdown of the Swedish financial system in the early 1990s was followed by just a relatively short-lived, moderate recession. The title of Reinhart and Rogoff's book is supposed to be ironic: "this time is different" is what policymakers and financial titans always say just before a bubble pops. But when it comes to the aftermaths of crises, I think it is actually true. Each time really is different.

In my talk this afternoon, I will try to persuade you that the variation across episodes is large and important. A key piece of evidence for this view comes from new research I have been conducting with my husband and fellow economist, David Romer. This research focuses on the experiences of advanced economies in the postwar period before 2008. Even within this fairly narrow sample, we find large variation in the aftermath of crises.

I will also talk about what I hope are two revealing case studies: the Great Depression of the 1930s in the United States, and the experience of the Atlantic economies following the 2008 crisis. Both these cases are times when crises had unusually large overall impacts. But both are also times when there was large but often underappreciated variation.

The realization that the aftermath of crises varies greatly naturally raises the question—what explains the variation? This is incredibly important—because if we can understand why some outcomes are better than others, perhaps the next time we are faced with a crisis, we can take actions to ensure that we are one of the fortunate ones.

I will argue that three factors are central to accounting for the differences across episodes. The first and most obvious is the severity and persistence of the crisis itself: worse crises have worse aftermaths. The second is the presence of additional shocks: some crises have worse outcomes than others because they are accompanied by additional developments that also harm the economy. And finally, the policy response matters greatly: what policymakers do in response to a crisis has a fundamental impact on what happens to the economy in the wake of financial turmoil. You will see that these factors show up as important both in our study of advanced countries in the postwar period and in the two case studies.

II. NEW EVIDENCE ON THE AFTERMATH OF FINANCIAL CRISES IN ADVANCED COUNTRIES, 1967–2007

Let me begin with the new research David and I have been doing on postwar crises.³ The starting point of the project is the derivation of a new measure of financial distress for 24 advanced countries for the period 1967 to 2007. To analyze the aftermath of financial crises, you need to know when crises occurred and how bad they were.

This turns out to be harder than you might think. We don't have obvious quantitative indicators of such episodes. This is partly because of data limitations. Even for advanced economies in the last fifty years, we don't have the detailed financial statistics we would like—such as an interest rate spread for each country showing the

difference between the funding costs for financial institutions and a safe interest rate. There are also conceptual problems with most quantitative measures. Something like an interest rate spread may often capture trouble in the financial sector, but not always. Because of asymmetric information, financial problems sometimes show up in quantity rationing rather than in higher interest rates. So in place of such quantitative measures, scholars have generally based chronologies of when crises occurred on narrative sources.

One problem with those chronologies is that the derivation is often somewhat haphazard. What counts as a “crisis” is sometimes fuzzy. And the narrative sources consulted are often not identified or vary greatly across countries. As a result, the existing chronologies often differ substantially from one another—and not just by a few months, but by years. Moreover, these chronologies typically only provide information on when a crisis occurred—not how bad it was, or the twists and turns in financial distress over the episode.

New Measure of Financial Distress. For these reasons, a central part of what David and I do in our paper is derive what we think is a better measure of financial distress for a sample of advanced countries. It has several features. One is that it is based on a single real-time narrative source—the *OECD Economic Outlook*. This is a long volume describing conditions in each OECD country that has been published twice a year since 1967. We check this source against others, such as the staff reports for IMF Article IV consultations and the *Wall Street Journal*, and find it is quite reliable and accurate.

A second feature of our new measure is that we use a specific definition of financial distress: a rise in what Ben Bernanke called the cost of credit intermediation.⁴

The cost of credit intermediation is the cost to financial institutions of providing loans. It is influenced by the rate at which banks can raise funds relative to a safe interest rate, and their costs of screening and monitoring. Problems in the financial system, like bank failures, panics, loan defaults, and erosion of capital will lead to an increase in the cost of intermediation. That in turn will reduce the supply of credit.

What we do is read the *OECD Economic Outlook* watching for descriptions consistent with increases in the cost of credit intermediation. Importantly, when we find such an increase, we try to scale its severity. We try to identify smaller and larger increases. What ultimately comes out is a relatively continuous measure of financial distress for 24 countries for the postwar period before 2008. It is semiannual, because the narrative source comes out twice a year.

Our new measure has interesting similarities and differences with existing chronologies. In our paper, we compare it with two alternatives: Reinhart and Rogoff's crisis chronology from their book and the chronology from the IMF Systemic Banking Crises Databank.⁵ Some episodes that the alternative chronologies identify as crises—for example, Spain in the late 1970s and early 1980s—do not show up in the *OECD Economic Outlook* at all.

Even in cases where both we and the alternatives see a crisis, the timing and other information is often very different. Figure 1 shows some examples. The green line in each picture shows our new, scaled measure of financial distress. The red vertical lines are the start and end dates of Reinhart and Rogoff crises; the blue vertical lines are the start and end dates of IMF crises. One thing you can see is that the existing chronologies often differ greatly from one another. For example, Reinhart and Rogoff

have the crisis in Japan ending just as the IMF sees it starting. This is why we thought there was need for a new measure.

You can also see that the new series provides additional information—not just start and end dates of crises, but the relative size and the twists and turns in distress over an episode. For example, Japan's crisis at its worst in the late 1990s and early 2000s was noticeably more severe than that in, say, Sweden in 1993. Japan's crisis was also much more persistent than anyone else's, with periods of acute distress mixed in with long periods of low-level trouble. You can also see that the timing of distress shown by the new measure is often quite different from that in existing chronologies. For example, the new measure dates the Norwegian crisis substantially later than Reinhart and Rogoff do.

We think the new measure is a useful improvement. It is confirmed by other real-time narrative sources. It captures variation in the severity of distress. And it is consistent across countries.

Average Aftermath of Crises. The obvious first thing we do with our new measure of financial distress is look at what happens on average after crises. This is the parallel to what the literature has focused on—the typical aftermath.

Our empirical approach is straightforward. We have data on financial distress and output for 24 advanced countries in the postwar period. We run standard panel regressions to estimate the response of output at various horizons after time t to distress at t . For anyone interested in the econometric particulars, we use the Jordà local projection method to estimate the impulse response function of output to distress. We then simulate the impact of an innovation of a 7 in our new measure, which is roughly

the point on our scale that is equivalent to the cut-off for what the IMF counts as a systemic crisis.

Figure 2 shows what comes out of this analysis. This graph shows the response of real GDP to a moderate crisis. The solid line is the point estimate. The dashed lines are the two-standard-error bands. What you see is that the impact is negative, very fast (the main effect is in the contemporaneous half-year), and statistically significant. It is also quite persistent; the effect doesn't disappear over the five years following the rise in distress. It is also distinctly "medium" in size. A moderate crisis reduces real GDP on average by about 4%. This is not trivial by any means, but also not huge either; it is about the size of a serious postwar recession in the United States.

In our paper, we talk a lot about the robustness and the interpretation of this finding. For example, we find that the persistence of the effects essentially disappears when one leaves Japan out of the sample. Another important point is that there is almost surely reverse causation. Financial distress reduces output, but declines in output also cause financial distress. As a result, the true causal impact of a crisis is almost surely less than even this moderate estimate that we find.

Variation across Episodes. However, my main focus this afternoon is not the average impact of a crisis, but the variation across episodes. To analyze this, we look in detail at the six episodes in our sample where our measure of distress hits a 7 or above. We do the following exercise. We compare what actually happened to real GDP in these episodes with a simple forecast based just on lagged output. In making the simple forecast, we only use output up through a year before the acute financial distress. This way, the forecast captures what one would have predicted would happen before

noticeable distress occurred. Thus, the difference between actual GDP and the forecast provides a measure of the negative aftermath of the crisis.

Figure 3 shows what comes out. The red line in each of these pictures shows the simple pre-distress forecast based just on lagged output. The blue line shows the actual path of GDP. I have expressed both series as indexes equal to zero a year before the acute financial distress. Because everything is in logs, the gap between the lines shows the percentage difference between the two.

The main thing that you are supposed to see is that the relationship between the red and blue lines is highly variable. This suggests that the aftermath of distress is highly variable. First, in two of the cases, Norway and the United States, it is very hard to see much of a negative aftermath of a crisis at all. In Norway, actual GDP is substantially higher following the distress than the simple forecast predicts. And in the U.S., actual output is only briefly and slightly below the forecast path.

Second, in two other cases, Sweden and Finland, the difference between actual output and the simple forecast is moderately negative. Actual output is about 2 to 4% below the pre-crisis forecast, suggesting a moderately negative aftermath of the crises.

Finally, in two cases, Japan and Turkey, actual GDP is far below the simple univariate pre-crisis forecast. This is consistent with the view that the aftermaths in these two episodes were terrible. But notice, even in these two extreme cases, the timing of the effects looks quite different. For Japan, the difference between the actual path of GDP and the forecast starts fairly small and builds gradually—eventually reaching an enormous gap. But for Turkey, the gap is initially very large, but it then closes quickly; within three years, actual output is above the pre-crisis forecast.

The bottom line of this analysis is the one given in the title of my talk—each time is different. On average, the aftermath of acute financial distress is negative and of moderate size. But if we focus on individual episodes, one sees a lot of variation around that average.

Explaining the Variation across Episodes. Given this variation in the aftermaths of crises in our sample, the next step is to see if we can understand or explain it. The particular factor that we examine in the paper is the severity and persistence of the distress itself. This is something we can look at precisely because our new measure of financial distress is scaled and relatively high frequency—so we observe the variation in severity and duration of distress.

To analyze the role of the nature of the crisis, we do the following. We take the simple forecasting framework I discussed before and expand it to include the actual evolution of financial distress. That is, in forecasting output say two years after the start of acute distress, we include not only distress up to the start of the crisis, but what happens to it in the subsequent two years. Does the distress get worse, resolve quickly, etc.? If including the evolution of distress substantially improves the fit of the forecast, that would be evidence that the severity and duration of distress is an important factor explaining the severity of the aftermath.

Figure 4 shows the results. The blue line in each graph is actual GDP as before, and the red line is again the simple univariate forecast based just on output through a year before the crisis. The green line is the new expanded forecast, which includes the evolution of financial distress. What you see is that in the four cases where actual GDP and the simple forecast are different (that is, there is a noticeable negative forecast error), the green line is much closer to actual GDP (the blue line). This is consistent

with the severity and duration of distress playing an important role in explaining the variation in aftermaths that we observe.

The results are particularly striking for Japan. Recall that there is a very large forecast error—suggesting that the aftermath of distress was quite bad in this case. But notice that the green line is much closer to actual GDP than is the univariate forecast (the red line). The forecast error shrinks by more than half when we include the actual evolution of distress—suggesting that the extreme severity and duration of the crisis is part of the reason why Japan’s aftermath was so bad.

Next, look at Sweden and Finland. The forecast including the evolution of distress is again noticeably closer to the actual behavior of GDP than is the simple univariate forecast, suggesting that the behavior of distress accounts for much of the variation we observe. Financial distress in both these episodes was of moderate size and very quickly resolved. This may explain why the output consequences were only moderate and short-lived as well.

Finally, look at Turkey. Recall that Turkey is another case where there is a large gap between the univariate forecast and actual output. Including the actual evolution of distress shrinks that gap by about one-third—so it explains some of why Turkey had a particularly extreme downturn, but not all of it.

In short, the analysis in our new paper shows that there is a lot of variation in the aftermath of postwar financial crises. A substantial fraction of that variation can be explained by the variation in the severity and persistence of distress itself. Not all crises are the same, and that is part of why all aftermaths are not the same either.

III. CASE STUDY: THE AMERICAN GREAT DEPRESSION OF THE 1930S

Now I want to move on to the two case studies I mentioned—the American Great Depression of the 1930s and the Atlantic economies after 2008. What do they reveal about my theme of variation in the aftermath of crises and, particularly, about the explanations for that variation? Let me start with the Great Depression.

Evidence of Variation. First, some key facts. The United States had a financial crisis in the early 1930s and the aftermath was terrible. We call it the Great Depression for a reason. Real GDP declined about 25% from its peak in 1929 to the trough in 1933. In the research I just showed you on the aftermath of crises in advanced countries after World War II, the response of GDP to a crisis was a decline of about 4%. So, the Depression in its sheer magnitude strongly supports my theme that there is a lot of variation in the aftermath of crises. Every once in a while, you get a real doozy.

But there is another way that the U.S. Depression fits my theme—and that is in the time-series variation. The U.S. didn't have just one financial crisis that started in 1929. We had a sequence of crises—and they, in fact, didn't start until the fall of 1930.

The stock market crashed in October 1929, but the financial system actually held up quite well. Figure 5 shows the discount rate of the Federal Reserve Bank of New York.⁶ You can see that right after the crash, the Federal Reserve did what a central bank is supposed to do: it flooded the system with liquidity and reduced interest rates in November 1929. As a result, we didn't have significant financial distress—in the sense of a substantial rise in the cost of credit intermediation and a severe reduction in the supply of credit—until the first wave of banking panics in October 1930.

Friedman and Schwartz, in their classic study of the American Depression, identify four distinct waves of banking panics.⁷ Figure 6 shows deposits in suspended or

failed banks.⁸ Friedman and Schwartz see four periods when people ran and the financial system came under extreme pressure: October 1930, spring 1931, September 1931 (when Britain left the gold standard), and early 1933. These dates are shown by the red vertical lines in Figure 6. If one were scaling the financial distress in the 1930s as we did for the OECD countries in the postwar era, I suspect that one would see elevated distress in the entire period from October 1930 to March 1933. But there would be definite spikes up during these waves of panics.

The aftermaths of the waves of banking panics reveal surprising variation. Figure 7 shows monthly industrial production in the U.S., with Friedman and Schwartz's four waves of panics marked off with vertical lines.⁹ What you can't help but notice is that after the first three waves of panics, output plummeted. But soon after the fourth wave, output not only ceased falling, but rose at a remarkable clip. Industrial production jumped 7% in April 1933 and rose 28% over the last 9 months of that year. So here within this one episode, we actually see the variation I have been discussing. Sometimes financial crises are followed by devastating output declines and sometimes by spectacular recovery.

Explaining the Cross-Section Variation. So how do we explain the variation we observe in the Great Depression? First, why was the overall aftermath of the financial crisis so much worse in the 1930s than in postwar crises? Part of the explanation involves exactly what I discussed came out of our new paper—the severity and persistence of the crisis itself. Worse crises have worse outcomes. One of the things that made the U.S. Depression so awful was that the financial distress was severe and unrelenting. There were those repeated waves of banking panics. The net result was that more than a third of the banks in existence in 1929 were not around in 1933. In this

way, the U.S. in the early 1930s was like 1990s Japan on steroids; the aftermath was uniquely grim because the amount of financial distress was particularly large and persistent.

However, this is only part of the explanation for why the outcome was so wretched in this period. Another piece of the story is that the American economy was hit by additional shocks. A frequent feature of cases where the aftermath of crises has been particularly bad is that there were often things happening at the same time as the crises that depressed output directly. For example, as I have described, the 1929 stock market crash didn't immediately lead to banking panics and a contraction of lending. But in a paper I wrote many years ago, I found that it did have a large direct depressing effect on the economy.¹⁰ The crash generated economic uncertainty, and so led to a severe drop in consumer purchases of durable goods and business investment, as households and firms put off spending while they waited for the uncertainty to be resolved. Figure 8 replicates a table from that paper. It shows that consumer spending immediately after the crash dropped strongly in irreversible durables like autos, moderately in semidurables like housewares and clothing, and not at all in food and other perishables—just as the uncertainty hypothesis would predict.

A factor that was even more important than the additional shocks in explaining why the aftermath of the financial crisis was so wretched in the early 1930s was the equally (if not more) wretched policy response. The Federal Reserve did painfully little to try to stop the waves of panics. Instead, it allowed the money supply to plummet as depositors pulled their funds from banks, and banks sought to shore themselves up by keeping higher levels of reserves. Indeed, in October 1931 the Federal Reserve

compounded the monetary contraction by jacking up interest rates to try to convince the world that the U.S. would not follow Britain off the gold standard.

The result of the acute monetary contraction was a strong swing to deflationary expectations. A recent study that David Romer and I did looked at inflation expectations as revealed by the business press at the time.¹¹ We found that Federal Reserve inaction in the presence of bank runs led people to expect deflation. For example, in October 1930, as the first wave of panics was beginning, *Business Week* (October 22, 1930, cover) said:

The deflationists are in the saddle. ... With the three largest banks lined up on their side ... and with the Federal Reserve authorities standing idly by, it has become clear since the middle of September that what was a comparatively mild business recession during the first half of 1930 has now become a case of world-wide reckless deflation.

This expected deflation pushed real interest rates up to double digits, and likely reduced investment. This, rather than just the direct effects of the financial distress, is surely part of why spending and output crashed so terribly.

Just to complete the story of the wretched policy response, the U.S. also enacted a large tax increase in June of 1932. The fall in output in 1930 and 1931 obviously took a terrible toll on tax collections and resulted in a substantial budget deficit. In response, President Herbert Hoover pushed through one of the largest peacetime tax increases in U.S. history. It was a fiscal contraction of close to 2% of GDP. This too surely helps to explain why output fell so deeply in this particular episode.

Explaining the Time-Series Variation. We can understand why the aftermath of the financial crisis in the Depression was so awful overall as the confluence of particularly severe and repeated financial distress, additional shocks, and a truly terrible policy response. But how do we explain the time-series variation within the

Depression? Why were the first three waves of banking panics followed by unprecedented depression, while the last was followed by rapid growth?

Part of the explanation lies in that crucial word “last.” The waves of panics built on each other. The failure to stem the first wave made the second wave more likely and more severe, and so on. The crucial fact about the fourth wave of panics is that Franklin Roosevelt, who became president in March of 1933, took steps to not just end the crisis, but break the cycle of repeated financial distress. Within just two days of taking office he declared a nationwide banking holiday. All banks were closed to give people time to cool off, and inspectors a chance to check the books and evaluate the solvency of each institution. By certifying safe institutions and closing weak ones, this action helped to more permanently stabilize the financial system.

An even more important explanation for why the aftermath of the fourth wave of panics was so different from the first three was the rest of the policy response. Since the Federal Reserve had shown itself unwilling to even stabilize the money supply, much less increase it, Roosevelt looked for a way to do this through legislation and executive action. The U.S. effectively went off the gold standard in April 1933, and the Treasury used the resulting appreciation of our gold stocks and a gold inflow to issue gold certificates—which functioned just like additional currency. The U.S. money supply rose almost 30% over the subsequent two years.

Roosevelt also enacted a notable, if not particularly large, fiscal stimulus in late 1933. An early public works program put four million unemployed people to work repairing roads and doing other simple infrastructure projects in the winter of 1934.¹²

Finally, President Roosevelt understood the central importance of expectations management. In addition to his flurry of stimulative monetary and fiscal measures, he

spoke eloquently of fighting the Depression as if it were an invading foe, and of returning prices and incomes to their 1929 levels. The result was an amazing turnaround in expectations of both inflation and real growth. Figure 9 shows that inflation expectations, measured using commodity futures prices, changed radically from expectations of deep *deflation* to expectations of moderate *inflation* in just a matter of months.¹³ Stock prices also turned around with similar speed, suggesting a swing to more optimistic growth forecasts.

Together, this aggressive policy response put in train a startling recovery less than a month after what was arguably the most prolonged wave of banking panics in the Depression.

The bottom line of the 1930s case study is that it both reinforces and extends the themes I have been discussing. It shows that there is tremendous variation in the aftermath of crises both across episodes and within a single episode over time. The severity and persistence of the financial distress is certainly part of the explanation for this variation, but only part. The experience of the Great Depression drives home the importance of two other factors: additional shocks and the policy response.

IV. CASE STUDY: THE 2008 FINANCIAL CRISIS

The last topic that I want to discuss is the aftermath of the 2008 financial crisis. Like the Great Depression for those who lived through it, the 2008 crisis will likely be the defining economic event of our generation. As such, it is a crucial case study to examine. I should confess that my thoughts on the recent episode are inherently more speculative than what I have been discussing so far. Economists are still trying to figure

out what happened and why. And David and I are just beginning to extend our own research into the post-2007 period.

Variation in Aftermaths. As with the Great Depression, the recent episode provides important evidence of the variation in the aftermath of crises both across countries and over time.

The basic story of the recent crisis and its aftermath are well known. The crisis started brewing in 2007 in the United States and the United Kingdom. House prices began to tumble and subprime lenders in the United States got into trouble in the late summer of 2007. In the U.K., Northern Rock became severely distressed that fall. However, it wasn't until the uncontrolled failure of Lehman Brothers in September 2008 that the crisis intensified and leapt from our two countries to much of Europe.

The subsequent downturn was extreme. Output plummeted in the United States and the other countries directly affected by the crisis. I came on as an economic advisor to President-Elect Obama in November 2008. I remember vividly the first Friday in December, when we learned that the U.S. had lost half a million jobs in November and that the job losses in September and October had been another 200 thousand worse than we had thought at the time. When I briefed the President-Elect by phone, I was practically babbling—I just kept saying, “I am so sorry the numbers are just awful.” Finally, the President-Elect stopped me and said: “It's OK Christy, it's not your fault—yet.”

Output declined in all of the countries caught up in the crisis. It also dropped in many that were not directly involved. Korea, China, and Japan, all of whose financial systems remained stable, nevertheless suffered slowdowns as their exports to crisis

countries dried up. Overall, the IMF estimates that world GDP contracted 6½% at an annual rate in the last quarter of 2008, and nearly as much in the first quarter of 2009.¹⁴

In its overall severity and worldwide reach, the aftermath of the 2008 crisis was much worse than the average postwar experience. So, like the Depression, it provides evidence of variation that way. It is another case of a particularly wretched aftermath.

But, 2008 also provides evidence of variation across countries in the severity and duration of the post-crisis downturn. Some countries had much larger initial downturns than others. And countries have also varied greatly in how long their downturns have lasted. A simple way to see the differences across countries is to look at real GDP for each country relative to a common base period. I use the fourth quarter of 2007 as the base, which is roughly the start of significant financial distress in the U.S. and U.K. I compute the index as the difference in logs (multiplied by 100), so all the graphs I am going to present show the percentage difference in GDP in each subsequent quarter from the base period.

Figure 10 shows the graph for the U.S., the U.K., and the Euro area.¹⁵ GDP actually fell a little bit sooner and somewhat farther in the U.K. than in the U.S. Output in the U.K. in early 2009 was about 6% below what it had been at the end of 2007; in the U.S. it was about 4% below. The initial fall in the Euro area was in between that for the U.S. and the U.K.

The more striking difference in the picture involves the recovery. U.S. GDP turned around in the summer of 2009, and surpassed its 2007 peak in the middle of 2011. Euro area and British GDP started to recover at about the same time. However, recovery stalled somewhat in the U.K. in 2011 and 2012, before starting to grow steadily again in 2013. GDP in the Euro area not only stopped recovering around the start of

2011, but actually fell again. Europe suffered a second distinct recession in 2011 and 2012. So clearly, there has been quite a bit of variation in the experience of these areas.

Figure 11 shows the aftermath of the crisis in some of the individual countries of Europe: Germany, Ireland, Switzerland, and Spain. I will confess that I chose these countries precisely to emphasize the variation in experiences. As you can see, the initial downturns range from small to large, and the subsequent paths range from pretty rapid recovery to steady continued declines.

So what explains the variation we observe? Many of the same factors explain both why the worldwide aftermath of the crisis in this episode was so bad relative to previous crises, and why some countries have had a much harder time than others.

Severity and Persistence of Financial Distress. First, as in the rest of the postwar era and in the Great Depression, the severity and persistence of the financial distress surely played a role. A big part of why the recent aftermath was so awful overall is that this crisis was unusually bad. I don't have formal evidence for this because David and I have just started to work on 2008 in our scaled framework. But, judging from the fact that almost the entire issues of the *OECD Economic Outlook* for the second half of 2008 and the first half of 2009 are about the crisis, it seems pretty clear that 2008 was very severe.

Perhaps even more important, the financial distress was correlated across countries. The reason those *OECD Economic Outlooks* for 2008 and 2009 are so long and exhausting to read is that there is financial distress in many countries at the same time. In other crisis episodes in the postwar era, financial distress only affected a single country (like Japan) or a narrow region (like the Nordic countries). The correlation in distress across countries in 2008 likely made the aftermath worse. Financial

institutions in other countries weren't able to step in and provide credit in troubled countries, because almost everybody was troubled.

While the financial crisis was bad overall, it was likely worse in some places than others. The IMF has identified which OECD countries it thinks had a systemic crisis: the United States, the United Kingdom (both starting in 2007), Austria, Belgium, Denmark, Germany, Greece, Iceland, Ireland, Luxembourg, the Netherlands and Spain (starting in 2008).¹⁶ The IMF also identified five OECD countries as having a “borderline” crisis—suggesting the financial distress was lower there. These countries are France, Portugal, Italy, Switzerland, and Sweden.

Figure 12 shows the fall in GDP in the borderline-crisis countries, along with the U.K. for comparison. It looks as though these borderline-crisis countries had slightly milder initial downturns on average than the full-fledged-crisis U.K. However, there is substantial variation in their individual experiences, suggesting we should have a large standard error around that average. We perhaps have some suggestive evidence that the size of the crisis helped determine the variation in outcomes afterward—but this is something that needs more systematic research.

Where there might be stronger evidence of a correlation is with the persistence of the distress. Figure 13 shows the behavior of GDP in some of the countries where the negative consequences for output have lasted the longest—Spain, Greece, Ireland, and Portugal. One common feature of these countries is that their financial systems have remained very troubled. For example, the OECD in 2013 described lending conditions in Ireland as “among the tightest in Europe.”¹⁷ More generally, European financial institutions have remained more troubled than, say, U.S. and U.K. institutions, and the post-crisis slump has lasted much longer in Europe. However, it is very hard to know

the direction of causation. Have the troubled economies remained weak because their financial institutions remain distressed, or are their financial institutions distressed because their economies remain weak? I suspect there is a strong element of both.

Additional Shocks. What else other than the severity and persistence of financial distress might explain the variation in outcomes that we observe? The evidence suggest that additional shocks again played a role in explaining both why the aftermath of 2008 was bad relative to other postwar crises, and why some countries have had a worse time than others.

Perhaps the most important of these additional factors was the bubble and bust of house prices in a number of countries. Important new research has suggested that this bubble and bust not only helped trigger the crisis, but also had a direct negative effect on consumer spending. Some of the best evidence for this comes from within the United States. Figure 14 reproduces a graph from a paper by Mian, Sufi, and Rao.¹⁸ The picture shows a scatter plot of the change in consumer spending along the vertical axis and the change in house prices along the horizontal axis. Each dot represents the experience of a county in the U.S. between 2006 and 2009. What you see is that counties to the left, which had larger drops in house prices, had bigger declines in consumer spending. To the degree that this bubble and bust in house prices was occurring in many countries, this can help explain why the overall aftermath of the 2008 crisis was so wretched.

There is suggestive evidence that this other factor may also help explain some of the variation we see across countries as well. One telling comparison may be Ireland and Austria. Figure 15 shows both house prices and output in the two countries.¹⁹ As you can see from panel (a) of the figure, Ireland had a huge bubble and bust in house

prices leading up to the crisis, whereas Austria had almost none of either. This may be one reason why Austria had a fairly mild downturn in 2009 and recovered quickly, while Ireland had a devastating collapse and, until recently, only a very slow and halting recovery.

The Policy Response. A third, and I suspect very important, source of variation in the aftermath of the crisis this time around has been the policy response. First, limitations on policy surely played a role in making the overall aftermath of the 2008 crisis worse than the postwar average. Confronted with genuine panic and plummeting output in 2008, central banks around the world dropped interest rates rapidly. Figure 16 shows the policy interest rate in a number of countries.²⁰ You can see that in October of 2008, the Federal Reserve, the Bank of England, the European Central Bank, and several other central banks took the unprecedented step of simultaneously cutting their policy interest rate by half a percentage point. But, central banks quickly ran out of conventional monetary firepower. They hit the zero lower bound on interest rates. This constraint made it substantially harder for them to support recovery.

On the fiscal side, countries again took substantial action. Figure 17 shows the fiscal stimulus measures of various G20 countries.²¹ A large number of papers have hit the journals in the last few years demonstrating that fiscal stimulus has powerful real effects, particularly at the zero lower bound. My own view, based on that evidence, is that one reason why the aftermath of 2008 was as bad as it was worldwide is that many countries (such as Italy, France, Germany, and even the United States) chose not to take as aggressive fiscal action as they could have.

Again, this factor—the monetary and fiscal policy response—not only helps explain why the aftermath of 2008 was wretched overall, but some of the important variation we see across countries. For example, I mentioned that the zero lower bound constrained monetary policy almost everywhere. But some central banks looked harder for ways to work around that constraint than others. The obvious contrast is between the U.S. Federal Reserve and the European Central Bank. The Fed undertook three rounds of quantitative easing between 2009 and 2013. The ECB has done far less—only recently starting its first serious efforts at QE. This is almost surely part of why the American recovery (as anemic as it has been in absolute terms) has been much, much stronger than the European one.

The argument holds even more strongly for fiscal policy. What explains why the recovery in countries such as Ireland, Spain, Greece, and Portugal has been so terrible since 2010? Fiscal austerity has played a key role. Figure 18 shows the IMF's estimates of the change in the high-employment budget surplus for a number of countries.²² As you can see, all of the numbers are positive—consistent with the fact that there has been fiscal consolidation virtually everywhere since 2009. But some of the most depressed countries today are the ones that have had the largest shifts toward austerity. It is not a perfect correlation; for example, Britain, as we know, also had a lot of austerity and is now growing nicely. Also, the countries that have undertaken the most extreme austerity measures obviously have other problems, such as high debt loads and structural weaknesses that likely have depressed output directly. But even so, I think that anyone other than perhaps Mr. Schäuble, the finance minister of Germany, would admit that the extreme fiscal contraction these countries have undertaken—often under

force from stabilization programs—has been an important reason why their growth has been so anemic since 2010.

Thus, this whirlwind tour of the aftermath of the 2008 crisis point to similar conclusions as the evidence from the other episodes. There is substantial variation in the aftermath of crises, and there are a handful of plausible explanations for this variation.

V. CONCLUSION

So where does all of this leave us? The only good thing that may have come out of the recent crisis has been a renewed interest in understanding financial turmoil and the toll it takes on the economy. It is wonderful and appropriate that students and faculty are throwing themselves into researching these topics. And economic historians especially have much to contribute. The research that has already been done has undoubtedly increased our understanding and appreciation for the fierce power of crises.

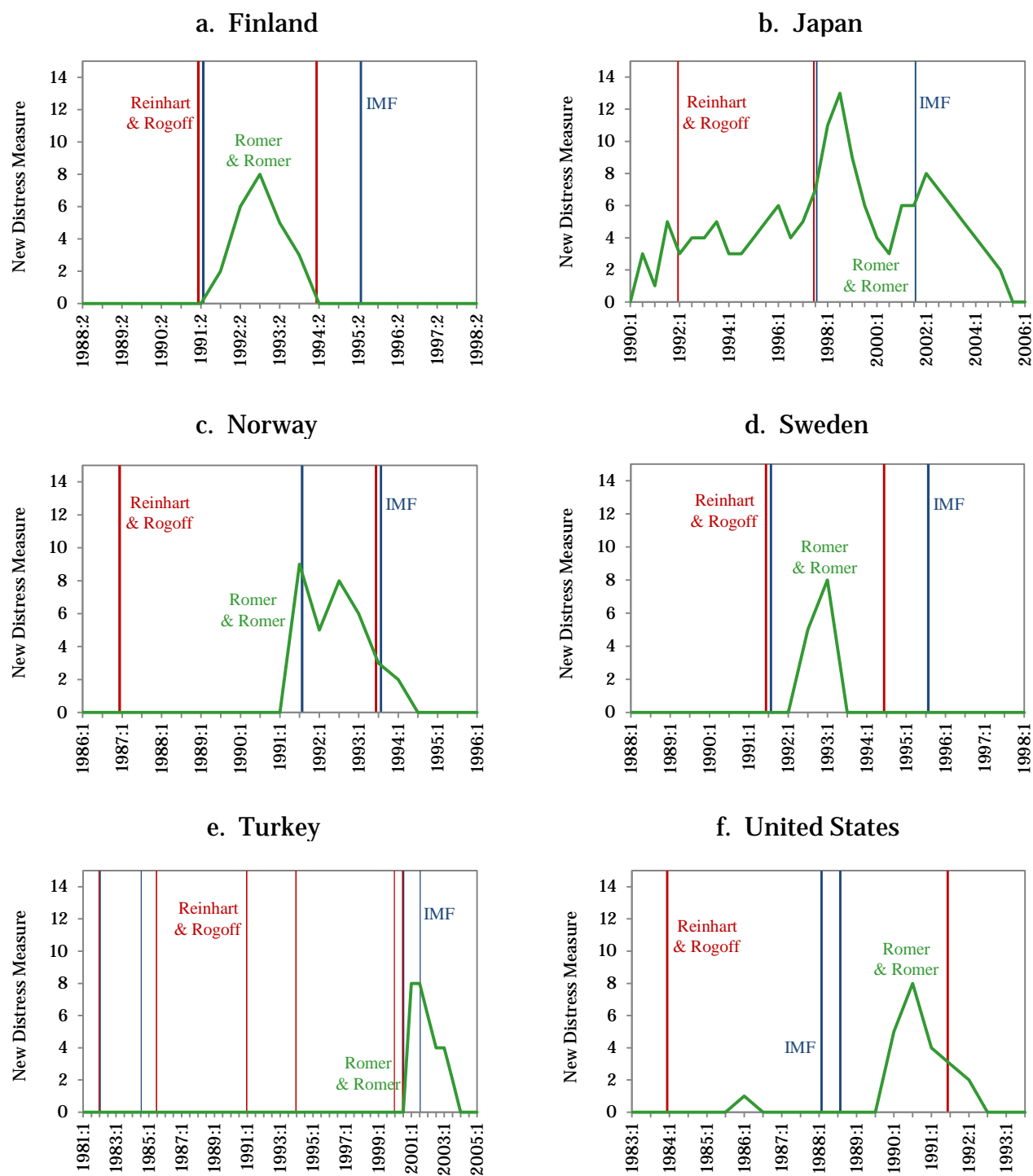
But in the process of making the point that financial crises can have powerful effects on the economy, researchers—and perhaps even more so, politicians and journalists—have lost sight of the historical variation in the aftermath of financial distress. Financial crises are not inevitably a death sentence for an economy. While some countries do experience terrible aftermaths, others fare remarkably well.

My talk today has been a plea to learn from this variation. We need to figure out why the variation exists, in hopes that we can use this knowledge to make better outcomes the norm and not the exception. I have suggested that three factors seem promising as explanations for the variation in the aftermaths of crises: the severity and

persistence of the distress itself; the presence of additional shocks, such as an asset price bubble and bust; and the policy response. All of these explanations are areas where we desperately need more research.

But if they turn out to be true and fundamental determinants of the variation, they provide an incredible message of hope. There are things policymakers can do to deal with crises faster and more definitively, and to cushion other shocks and prevent such developments as a housing bubble from occurring in the first place. Even more obviously, the monetary and fiscal policy response to a crisis is firmly in policymakers' hands. Harkening back to my discussion of the Great Depression in the United States, they can act like a Franklin Roosevelt and not a Herbert Hoover. Better policy actions can help ensure not just that each time is different, but that none is very bad.

FIGURE 1
Comparison of Crisis Chronologies in Key Episodes



Source: Romer and Romer, "New Evidence on the Impact of Financial Crises in Advanced Countries."

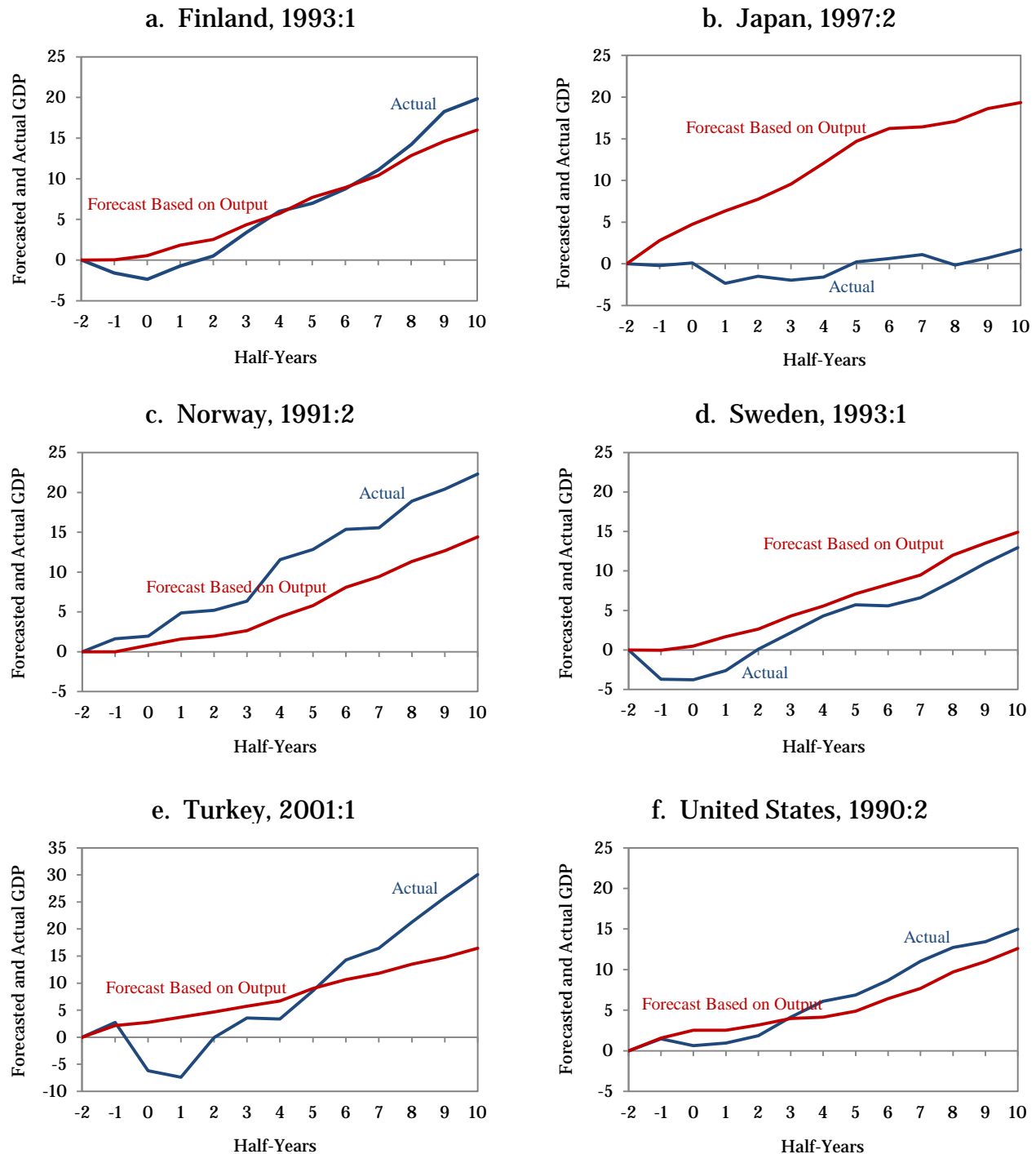
Notes: The vertical lines represent the start and end date of financial crises in the Reinhart and Rogoff and IMF chronologies, converted to semiannual observations.

FIGURE 2
Response of Real GDP to a Moderate Crisis



Source: Romer and Romer, "New Evidence on the Impact of Financial Crises in Advanced Countries."
 Note: The graph shows the response of real GDP to an innovation of 7 (a moderate crisis) in our new measure.

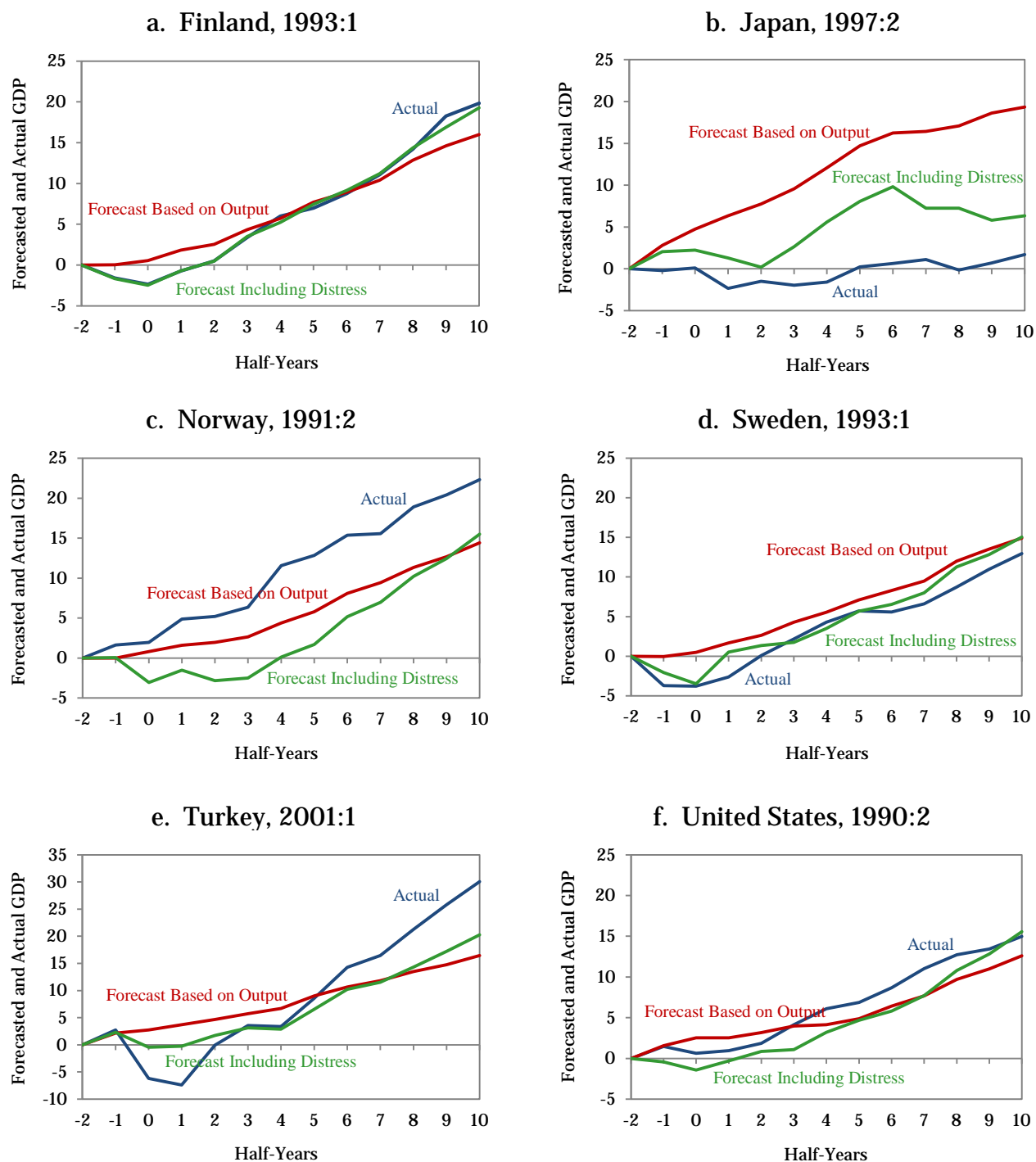
FIGURE 3
Actual and Forecasted GDP Following Crises



Source: Romer and Romer, "New Evidence on the Impact of Financial Crises in Advanced Countries."

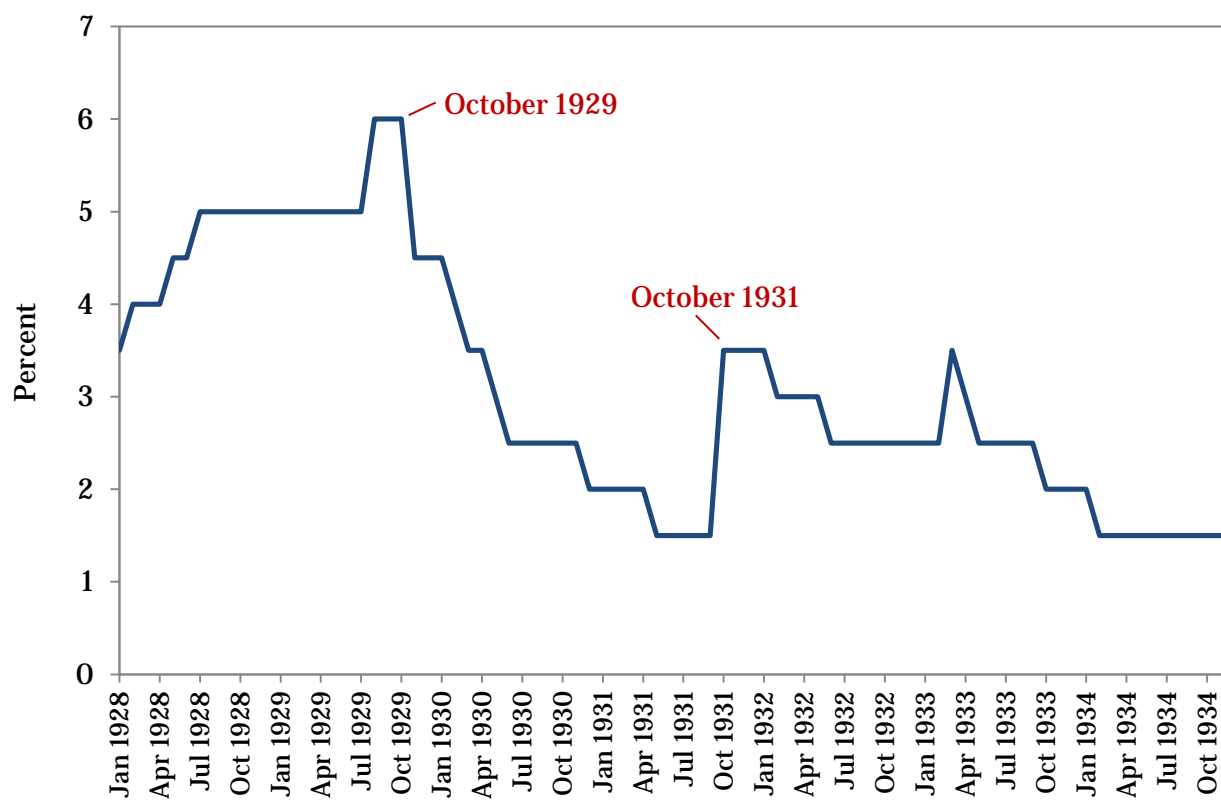
Notes: All values are expressed as 100 times the difference between the log of the series and the log of actual GDP a year before the distress variable hit 7. Thus it is an index equal to zero a year before the crisis. The forecast based on output uses actual data up through a year (two half-years) before the distress variable hit 7.

FIGURE 4
Actual and Forecasted GDP Following Crises, Accounting for Financial Distress



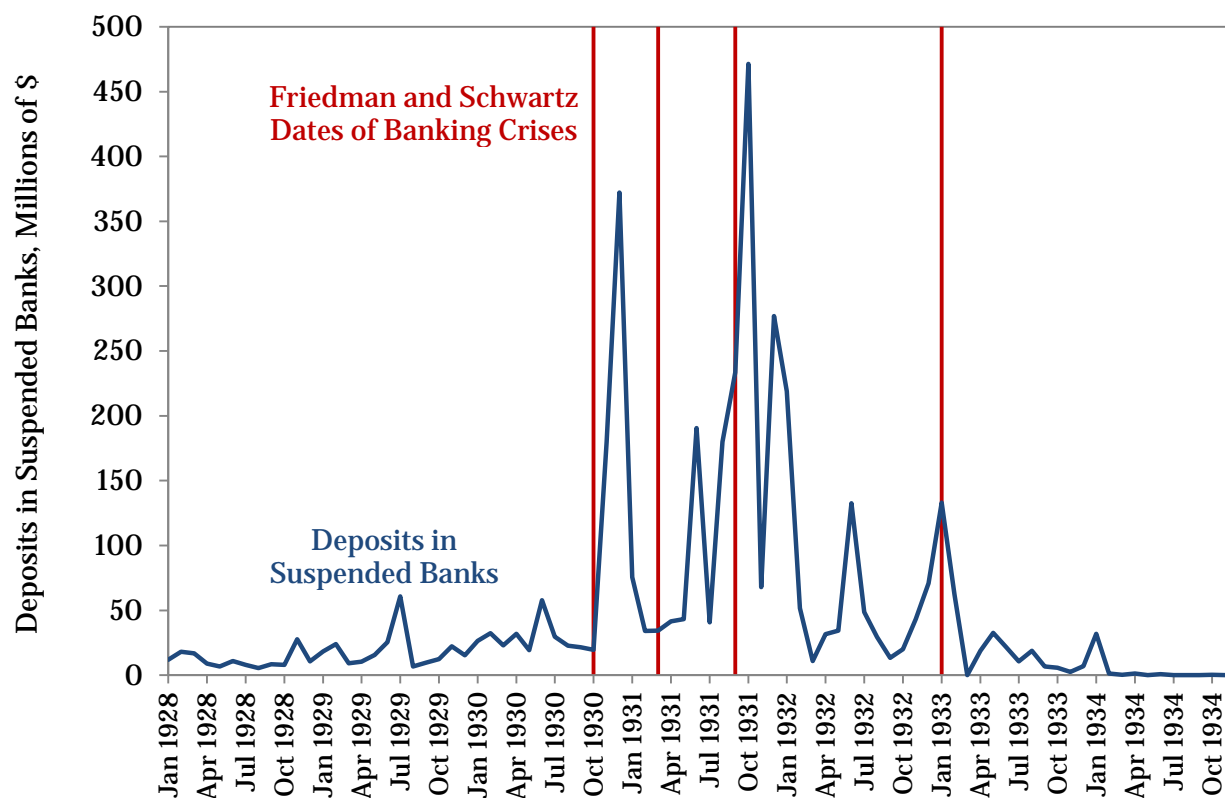
Source: Romer and Romer, "New Evidence on the Impact of Financial Crises in Advanced Countries."
 Notes: All values are expressed as 100 times the difference between the log of the series and the log of actual GDP a year before the distress variable hit 7. Thus it is an index equal to zero a year before the crisis. The forecast including distress uses output through a year before the distress variable hit 7 and the actual financial distress series through the date being forecast.

FIGURE 5
Federal Reserve Bank of New York Discount Rate



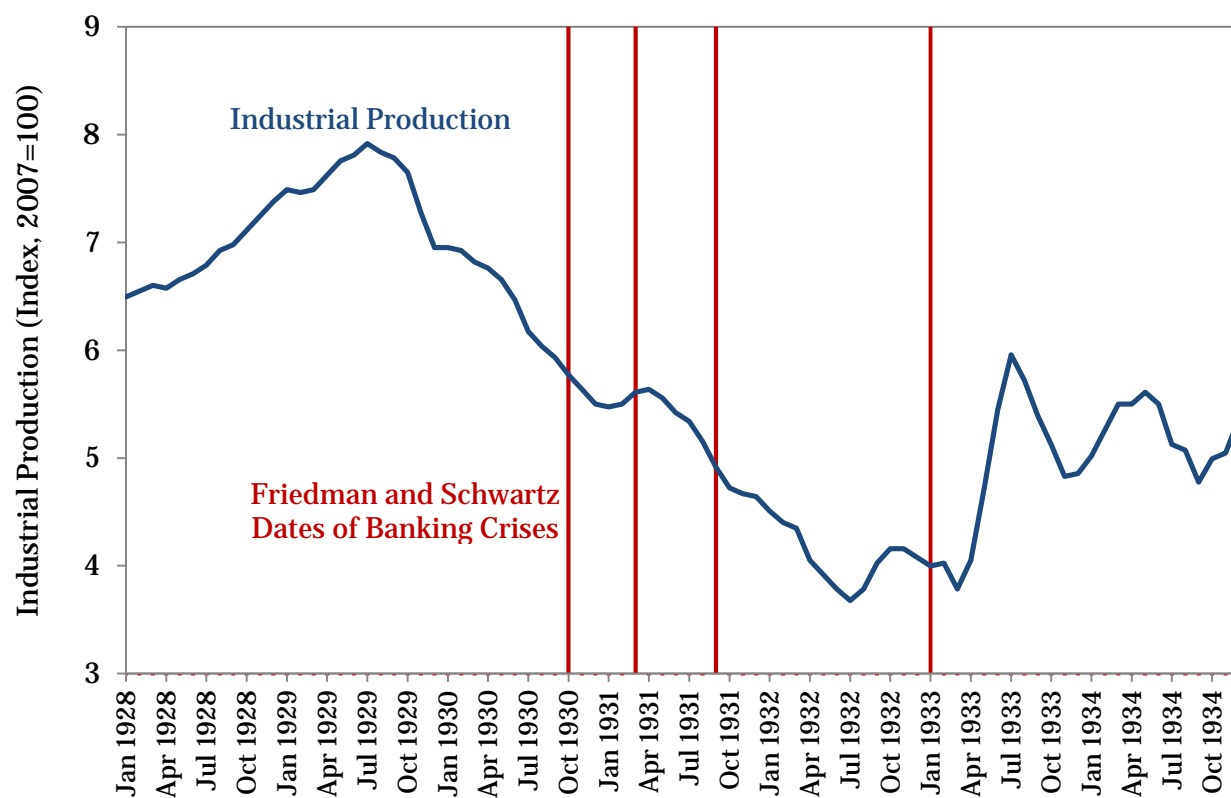
Source: Board of Governors of the Federal Reserve System.

FIGURE 6
Banking Crises in the Great Depression



Sources: *Federal Reserve Bulletin*, and Friedman and Schwartz, *A Monetary History of the United States, 1867-1960*.

FIGURE 7
Output and Banking Crises in the Great Depression



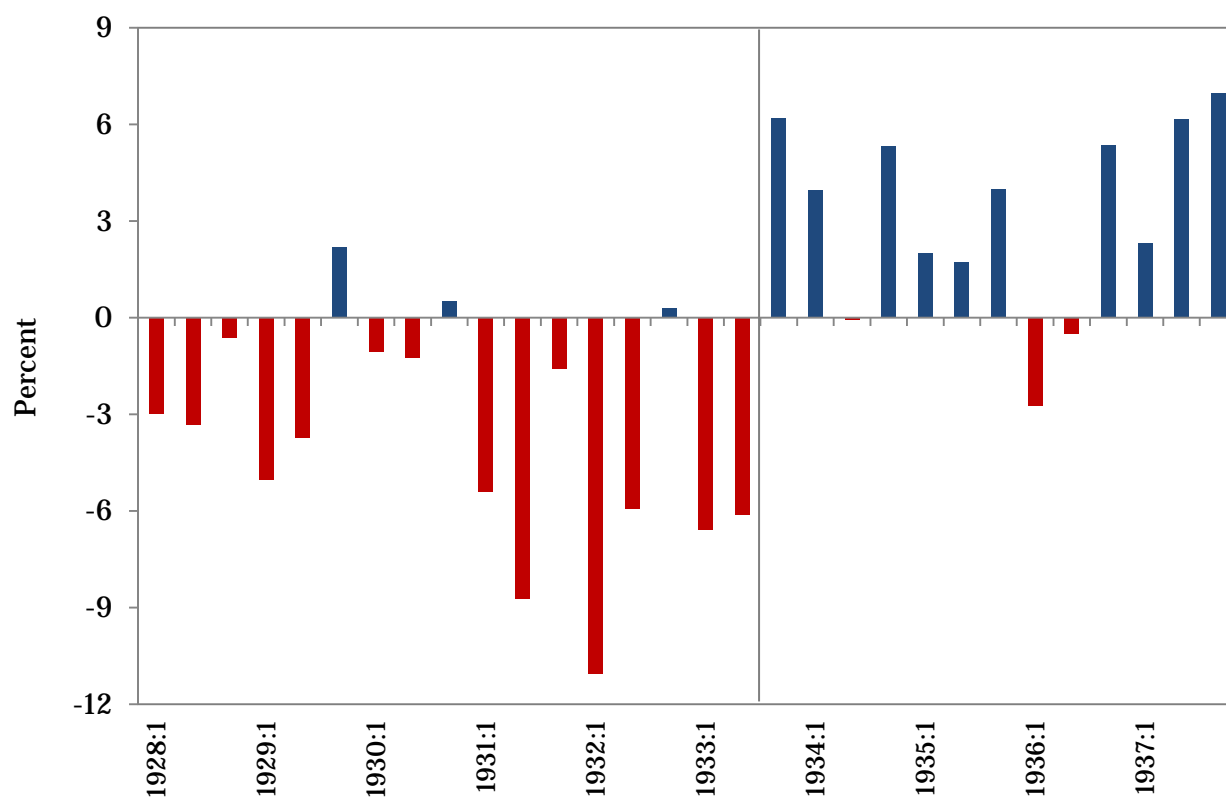
Source: Board of Governors of the Federal Reserve System.

FIGURE 8
The 1929 Stock Market Crash, Uncertainty, and the Collapse of
Consumer Spending on Durable Goods

	Cumulative percentage change in real seasonally adjusted retail sales					
	Oct. 1929	Nov. 1929	Dec. 1929	Jan. 1930	Feb. 1930	Mar. 1930
Automobile registrations	-5.5	-14.1	-18.9	-23.7	-11.7	-20.4
Department store sales	-8.4	-10.1	-4.5	-15.8	-11.7	-16.4
Mail-order sales	-4.1	-7.4	3.4	-20.6	-25.6	-35.8
Ten-cent store sales	-0.3	1.7	-2.5	-2.7	-0.1	-7.4
Grocery store sales	5.9	3.1	3.4	NA	NA	NA

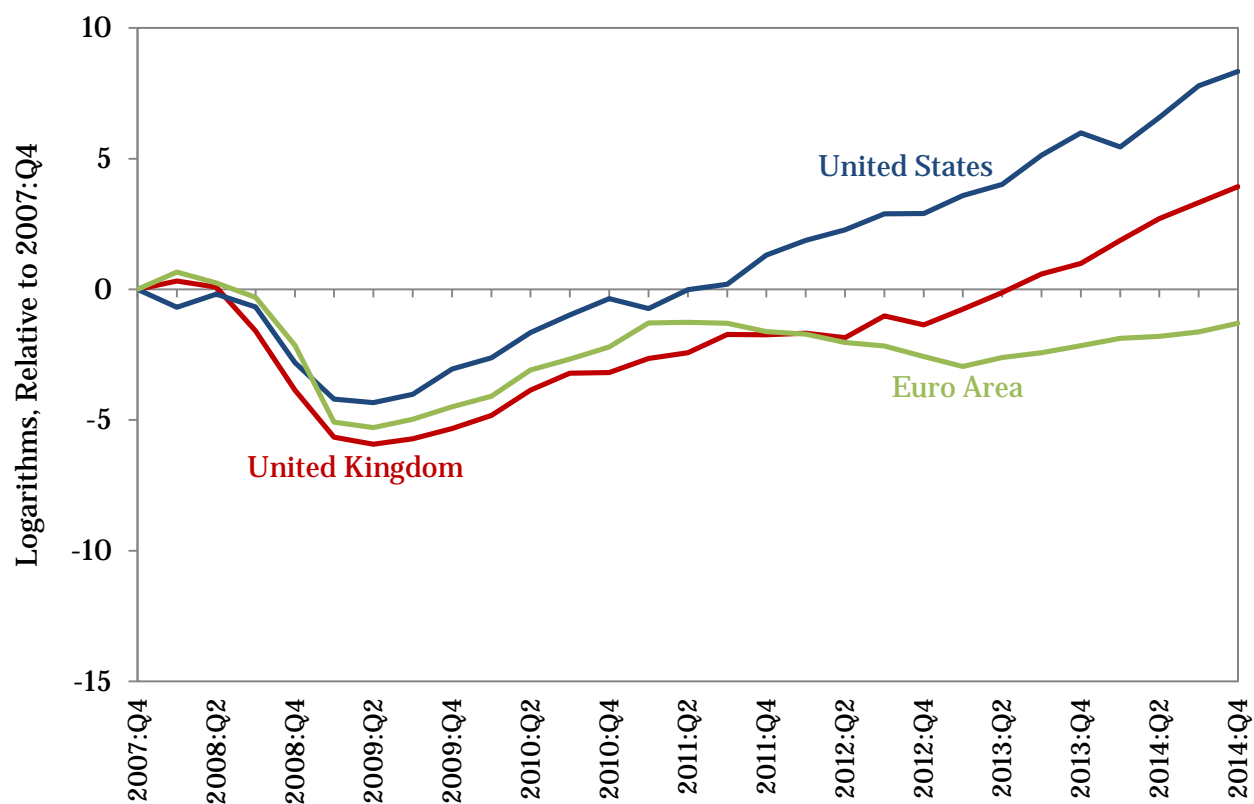
Source: Romer, "The Great Crash and the Onset of the Great Depression."

FIGURE 9
Expected Inflation as Measured Using Commodity Futures Prices



Source: Hamilton, "Was the Deflation during the Great Depression Anticipated?"

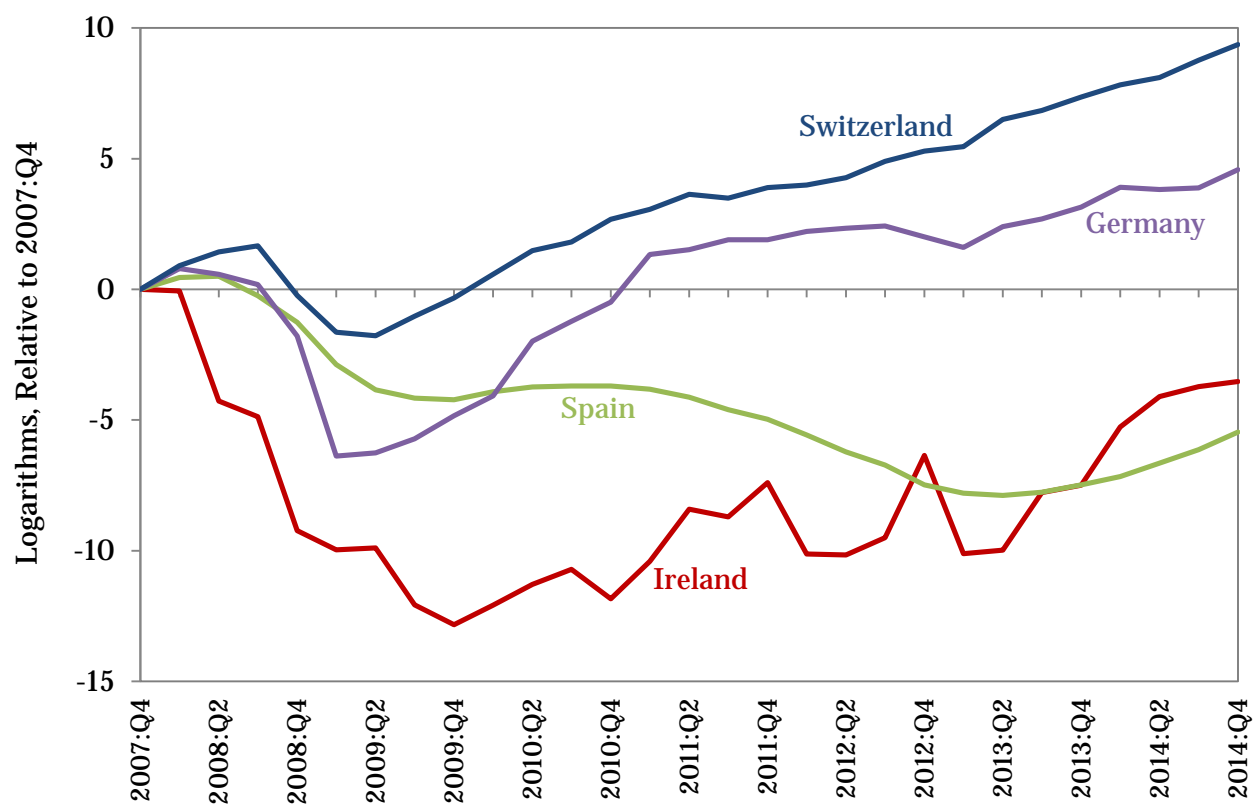
FIGURE 10
Real GDP following the 2008 Crisis: United States, United Kingdom, and Euro Area



Source: OECD.

Note: The line for each country shows the difference in the logarithm of real GDP in a given quarter from the logarithm of real GDP in 2007:Q4, multiplied by 100.

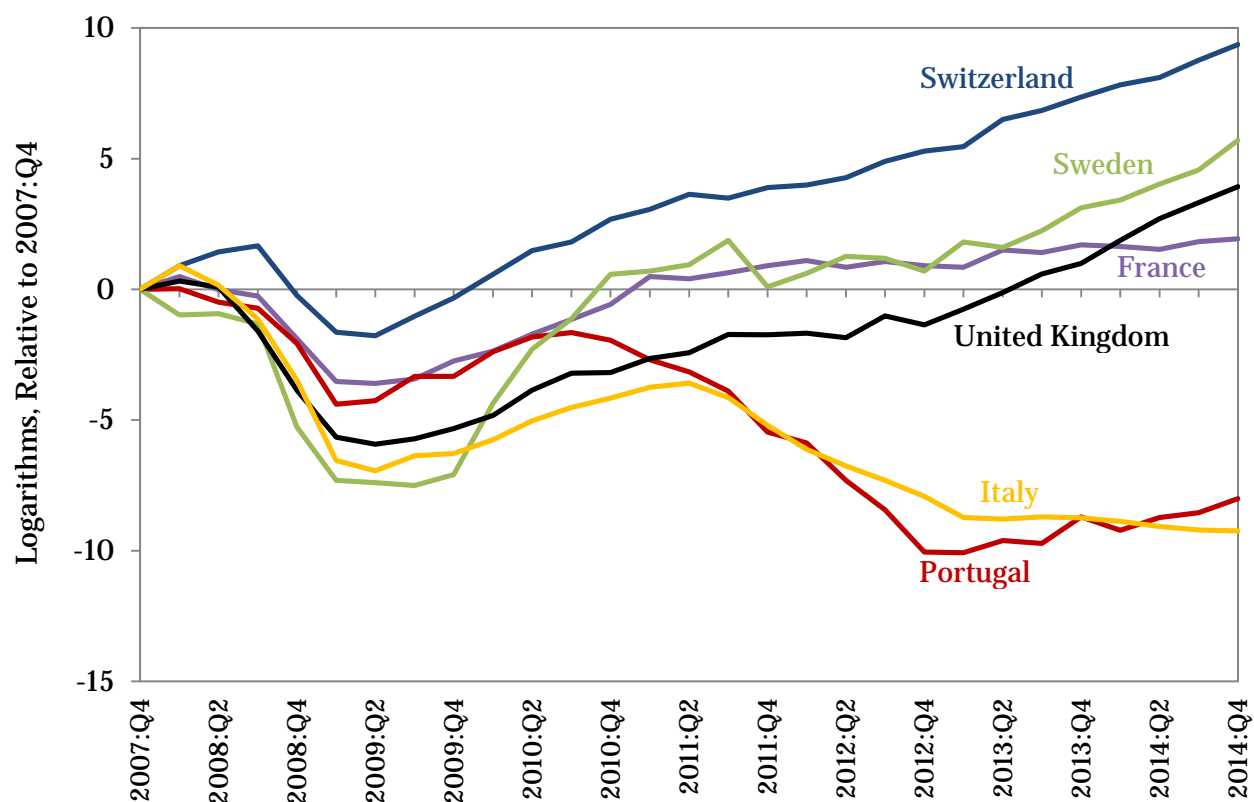
FIGURE 11
Real GDP following the 2008 Crisis: Germany, Ireland, Switzerland, and Spain



Source: OECD.

Note: The line for each country shows the difference in the logarithm of real GDP in a given quarter from the logarithm of real GDP in 2007:Q4, multiplied by 100.

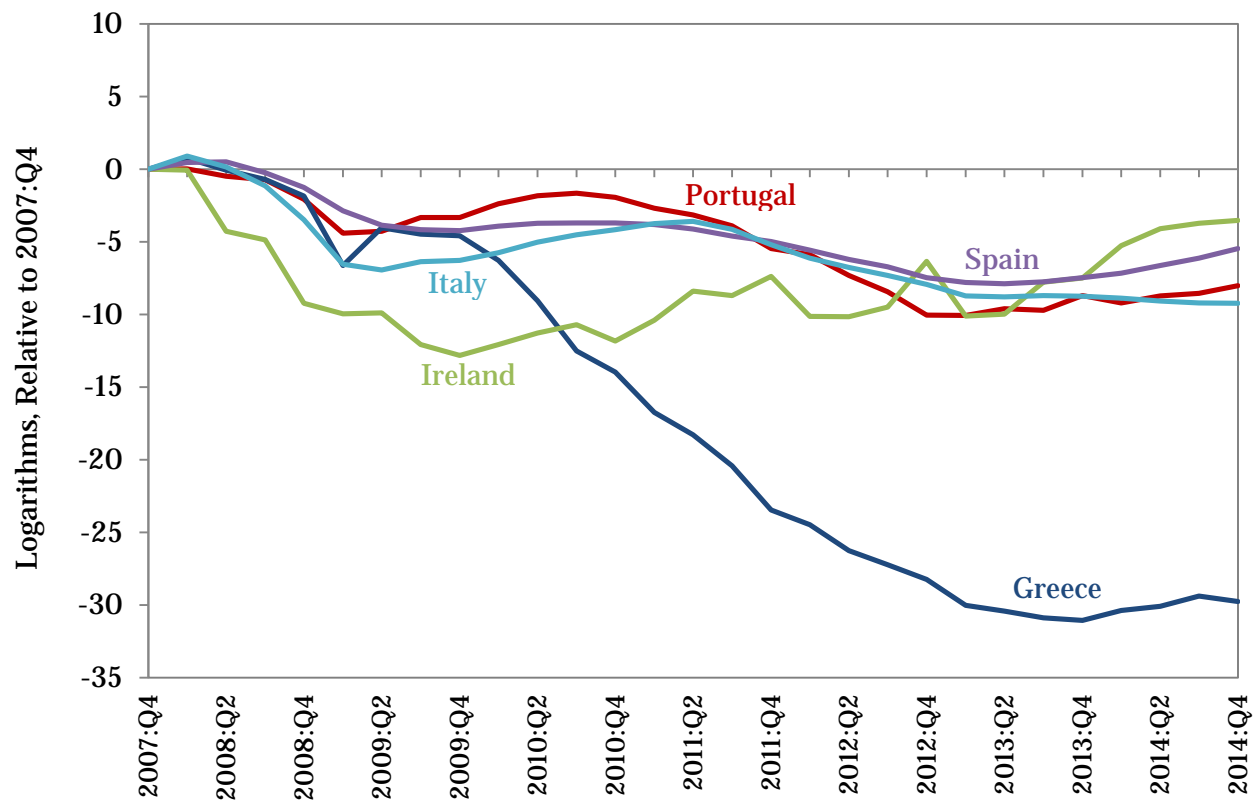
FIGURE 12
Real GDP following the 2008 Crisis: Borderline Crisis Countries



Source: OECD.

Note: The line for each country shows the difference in the logarithm of real GDP in a given quarter from the logarithm of real GDP in 2007:Q4, multiplied by 100.

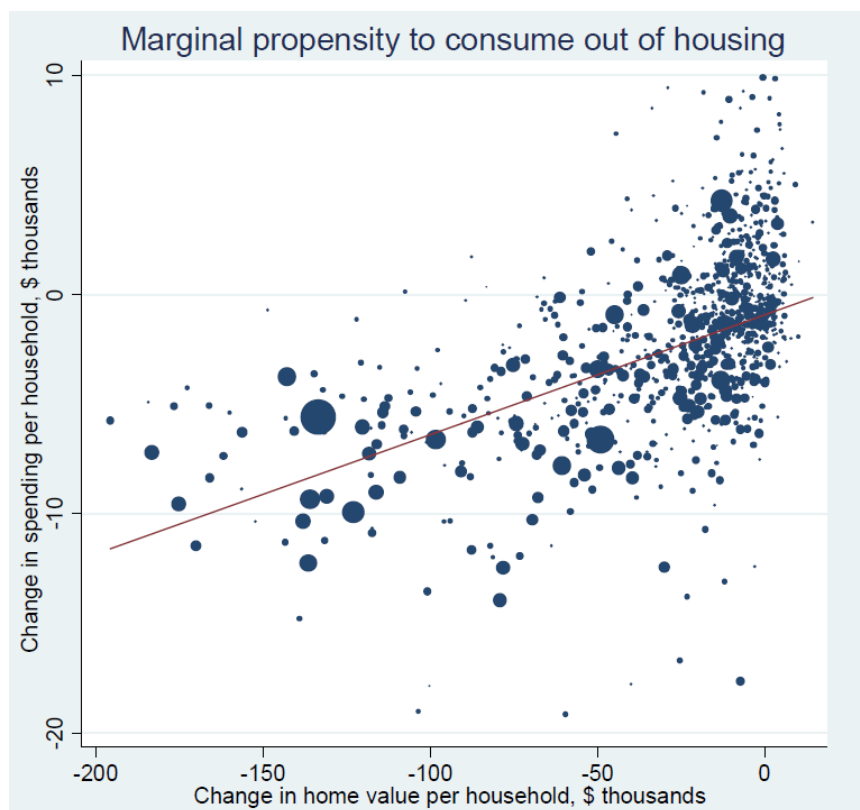
FIGURE 13
Real GDP following the 2008 Crisis: Countries with Prolonged Financial Distress



Source: OECD.

Note: The line for each country shows the difference in the logarithm of real GDP in a given quarter from the logarithm of real GDP in 2007:Q4, multiplied by 100.

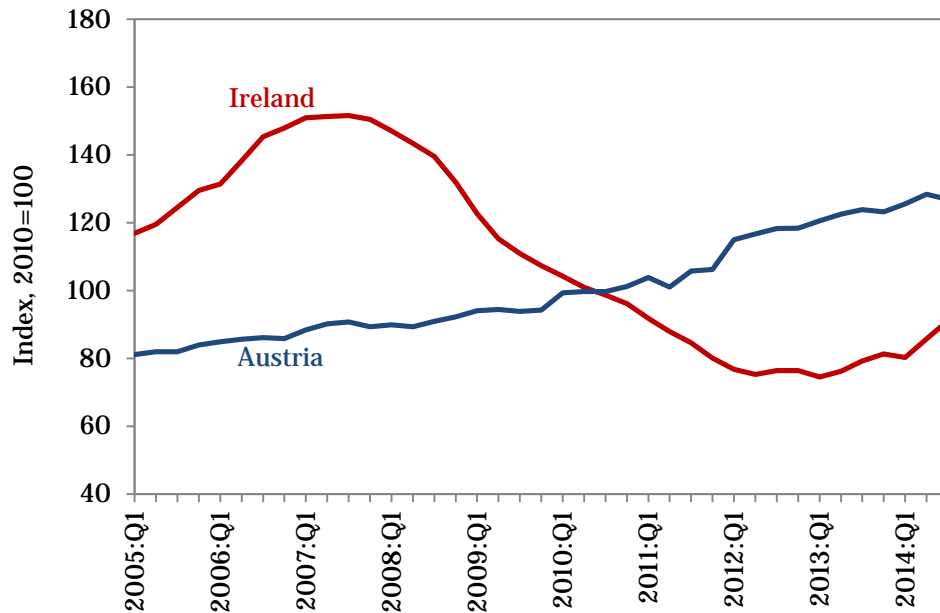
FIGURE 14
U.S. House Price Declines and Consumer Spending



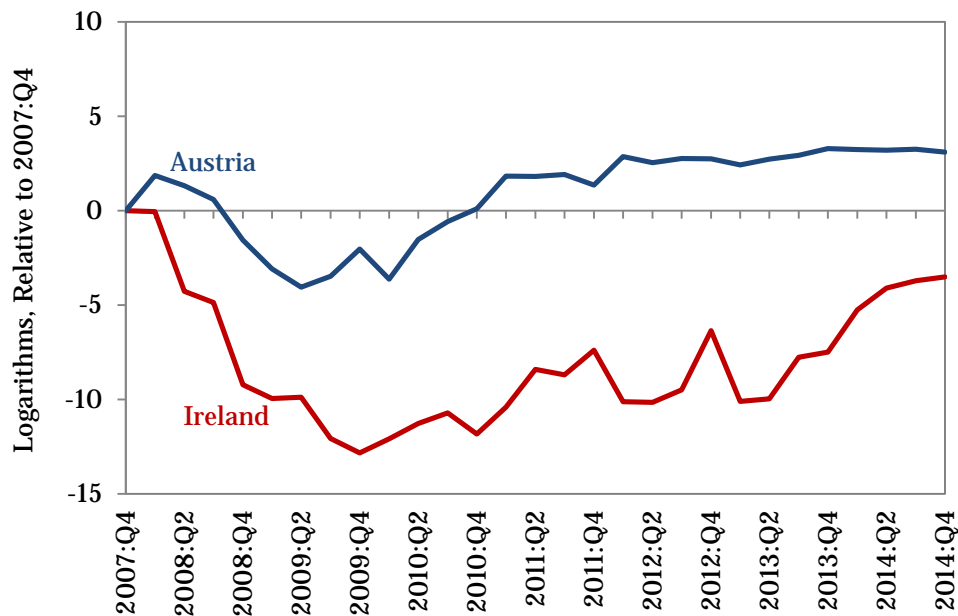
Source: Mian, Rao, and Sufi, "Household Balance Sheets, Consumption, and the Economic Slump."

Figure 15
House Prices and GDP following the 2008 Crisis: Ireland versus Austria

a. House Prices

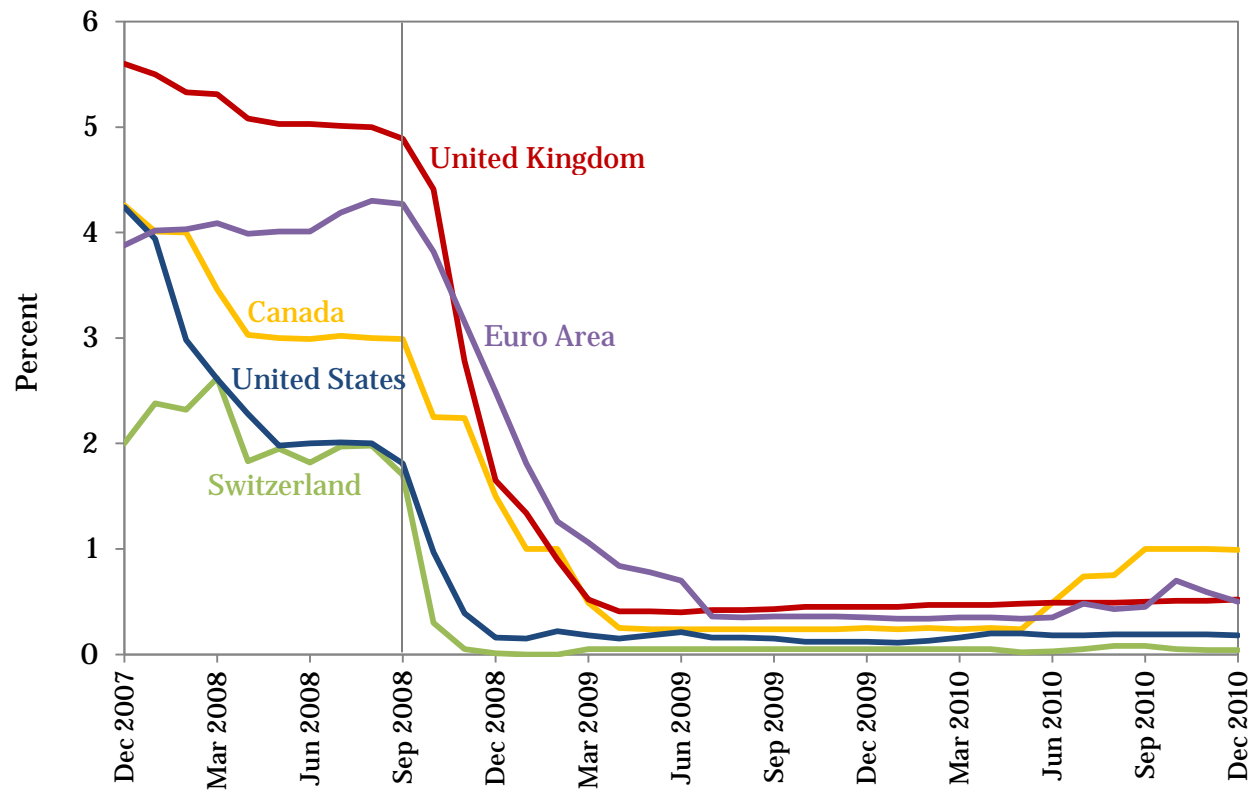


b. Real GDP



Source: House price data are from the Bank for International Settlements; GDP data are from the OECD.

FIGURE 16
Policy Interest Rates in the 2008 Episode



Source: OECD.

FIGURE 17
2009 Fiscal Stimulus as a Share of GDP in the G20

Argentina	1.5%	Japan	2.9%
Australia	2.9%	Mexico	1.6%
Brazil	0.6%	Russia	4.1%
Canada	1.8%	Saudi Arabia	3.3%
China	3.1%	South Africa	3.0%
France	0.6%	South Korea	3.7%
Germany	1.6%	Turkey	2.0%
India	0.6%	United Kingdom	1.6%
Indonesia	1.4%	United States	2.0%
Italy	0.1%	All G-20 Nations	2.0%

Source: 2010 *Economic Report of the President*.

Figure 18
Change in the Cyclically-Adjusted Surplus from 2009 to 2015 (projected)

	<u>Percent</u>
United States	3.9
France	2.6
Germany	1.6
Greece	20.3
Ireland	7.3
Italy	3.1
Portugal	7.8
Spain	6.6
United Kingdom	6.7

Source: IMF *Fiscal Monitor*, October 2014.

Note: A positive value for the change in the cyclically-adjusted surplus corresponds to a fiscal contraction.

NOTES

¹ Carmen M. Reinhart and Kenneth S. Rogoff, *This Time Is Different: Eight Centuries of Financial Folly* (Princeton University Press, 2009).

² Michael Bordo, Barry Eichengreen, Daniela Klingebiel, and Maria Soledad Martinez-Peria, “Is the Crisis Problem Growing More Severe?” *Economic Policy* 16 (April 2001): 51–82.

³ Christina D. Romer and David H. Romer, “New Evidence on the Impact of Financial Crises in Advanced Countries,” working paper, University of California, Berkeley, April 2015.

⁴ Ben S. Bernanke, “Nonmonetary Effects of the Financial Crisis in the Propagation of the Great Depression,” *American Economic Review* 73 (June 1983): 257–276.

⁵ The Reinhart and Rogoff chronology is from *This Time Is Different* (2009, Appendix A.4). The IMF Systemic Banking Crises Database is described in Luc Laeven and Fabián Valencia, “Systemic Banking Crises,” in Stijn Claessens, M. Ayhan Kose, Luc Laeven, and Fabián Valencia, eds., *Financial Crises: Causes, Consequences, and Policy Responses* (International Monetary Fund, 2014), pp. 61–137. See Romer and Romer, “New Evidence on the Impact of Financial Crises in Advanced Countries,” for more discussion of how we convert the alternative chronologies to semiannual start and end dates.

⁶ The data are from the Board of Governors of the Federal Reserve System, *Banking and Monetary Statistics*, 1943, p. 441.

⁷ Milton Friedman and Anna Jacobson Schwartz, *A Monetary History of the United States: 1867–1960* (Princeton University Press for NBER, 1963), pp. 308–332.

⁸ The data are from the *Federal Reserve Bulletin* 23 (September 1937), p. 909, Table 13.

⁹ The industrial production data are from the Board of Governors of the Federal Reserve System, <http://www.federalreserve.gov>, series G17/IP_MAJOR_INDUSTRY_GROUPS/IP.B50001.S.

¹⁰ Christina D. Romer, “The Great Crash and the Onset of the Great Depression,” *Quarterly Journal of Economics* 105 (August 1990): 597–624, Table 1.

¹¹ Christina D. Romer and David H. Romer, “The Missing Transmission Mechanism in the Monetary Explanation of the Great Depression,” *American Economic Review* 103 (May 2013): 66–72.

¹² Lester V. Chandler, *America’s Greatest Depression, 1929–1941* (New York: Harper & Row, 1970), p. 195.

¹³ The data are from James D. Hamilton, “Was the Deflation during the Great Depression Anticipated? Evidence from the Commodity Futures Market,” *American Economic Review* 82 (March 1992): 157–178, Table 7.

¹⁴ International Monetary Fund, World Economic Outlook Update, January 25, 2011, <http://www.imf.org/external/pubs/ft/weo/2011/update/01/>, CSV file with data for Figure 1.

¹⁵ The data are from the Organisation for Economic Co-Operation and Development, Quarterly National Accounts dataset, series VPVOBARSA, gross domestic product – expenditure approach, downloaded April 12, 2015.

¹⁶ Luc Laeven and Fabián Valencia, “Systemic Banking Crises Database: An Update,” IMF Working Paper No. WP/12/163, June 2012.

¹⁷ *OECD Economic Outlook*, November 2013, p. 157.

¹⁸ Atif Mian, Kamalesh Rao, and Amir Sufi, “Household Balance Sheets, Consumption, and the Economic Slump,” *Quarterly Journal of Economics* 128 (November 2013): 1687–1726, Figure IV.

¹⁹ The house price data are from FRED Economic Data, series QATN628BIS and QIEN628BIS, downloaded April 13, 2015. The data are collated by the Bank for International Settlements from national sources, BIS Residential Property Price database, <http://www.bis.org/statistics/pp.htm>. The output data are from the OECD (see note 15 for more details).

²⁰ The data are from the Organisation for Economic Co-Operation and Development, Finance dataset, immediate interest rates, call money, interbank rate, percent per annum, downloaded April 20, 2015.

²¹ The figure is from the 2010 *Economic Report of the President*, p. 98, Table 3-1.

²² The data are from the International Monetary Fund, *Fiscal Monitor*, “Back to Work: How Fiscal Policy Can Help,” October 2014, p. 3, Table 1.1b.